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SCIENCE NEWS LETTER

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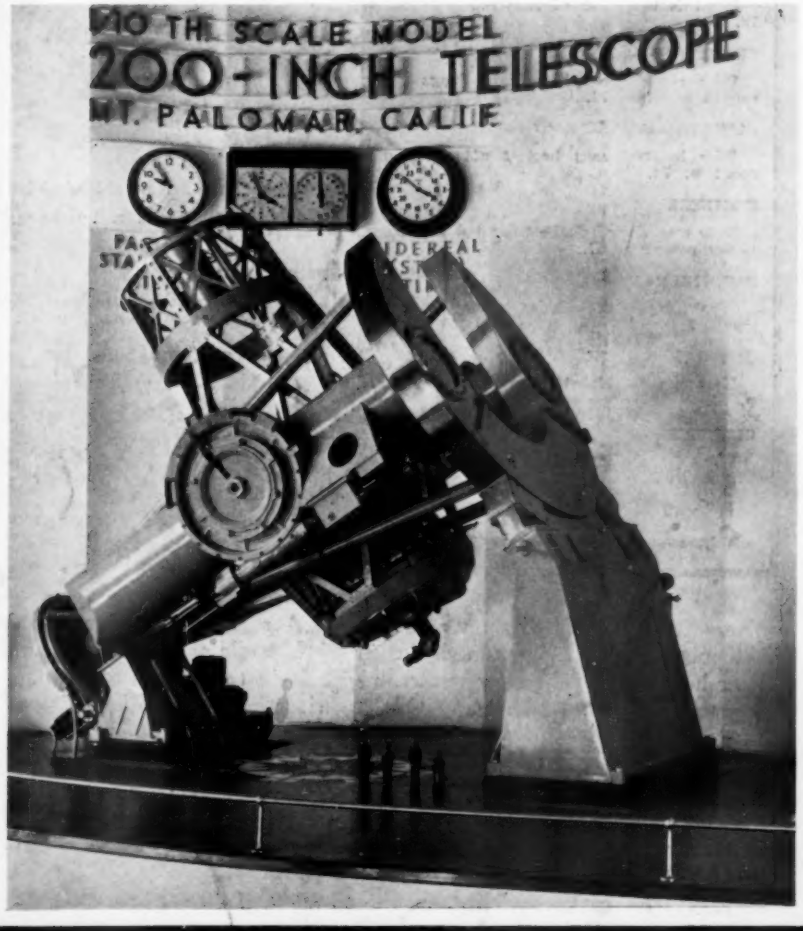
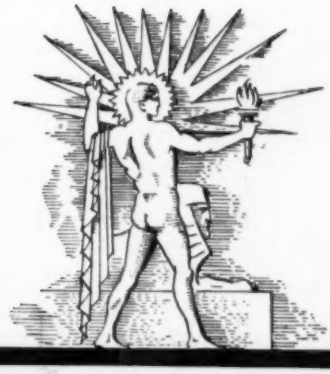
THE WEEKLY SUMMARY OF CURRENT SCIENCE •





August 3, 1940

Giant's Portrait

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A SCIENCE SERVICE PUBLICATION

Do You Know?

Barring mishaps, a *termite* may live five years.

Meteoric *iron* serves as material for some of the Malay daggers known as krises.

Arab traders who brought *cinnamon* from Ceylon to ancient Greece and Rome kept its origin a secret.

Even the United States, most self-sufficient in minerals of any country, has to *import* quantities of 15 industrial minerals.

Automobile tires of the future will be *smaller* with flatter and wider treads and lower air pressure, a rubber engineer predicts.

Earthworms are blind and deaf, and a writer in *Natural History* compares their voices to water dripping from a leaky tap.

Although temperatures in central Australia have gone as low as 14 degrees above zero, natives of this region wear no *clothing*.

Yokuts Indians of California marked a girl baby's *cradle* with a zigzag line and a boy's with a band of parallel diagonal lines.

High speed motion pictures show that a hummingbird's wing turns so far on the backward and downward stroke that it is *upside down*.

QUESTIONS DISCUSSED IN THIS ISSUE

Most articles which appear in SCIENCE NEWS LETTER *are based on communications to Science Service, or on papers before meetings. Where published sources are used they are referred to in the article.*

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PUBLIC HEALTH

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Snow surveys made by an army of 2,000 men in western mountains each winter help forecast the later water flow in western streams.

A recent act of Congress *protects* the bald eagle against hunters and collectors within the United States and its possessions, excluding Alaska.

SCIENCE NEWS LETTER

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GENERAL SCIENCE

Fate of Nobel Prizes Doubtful, Under Nazis

Science Academies in Lands Still Free Might Unite To Keep Long Tradition Unbroken, Is One Suggestion

WILL THE awarding of Nobel prizes continue in Nazi-dominated Scandinavia?

Swedish institutions administer these famous prizes in physics, chemistry, medicine and physiology and literature, while a special committee of the Norwegian Storting or parliament awards the Nobel peace prize.

With German troops in control of Norway, there is no possibility of the awarding of a peace prize, to be presented with appropriate ceremonies next December 10, Alfred Nobel's birthday. Herr Hitler is not in favor of the kind of peace the prizes represent. He has not liked Nobel prizes since the peace prize for 1935 was awarded to Carl von Ossietzky, the German journalist, then held by the Nazis in a concentration camp.

Presumably science is being carried on as best it may in Sweden, hemmed in by Nazi and Soviet invaded or dominated territory. Swedish scientists are thinking first of military defense, just as British scientists have in recent months given primary attention to making the British Isles safe from invasion.

Nominations for this year's Nobel prizes in the sciences and literature were submitted to prize-awarding institutions in Stockholm by January 31 if the usual practice was not upset by war conditions. Previous Nobelists are among those who make such proposals to the awarding bodies. The Swedish Academy of Science awards the prizes for physics and chemistry. The Caroline Medico-Surgical Institute of Stockholm awards the prize for physiology and medicine. The Swedish Academy awards the prize for literature.

From time to time some one or more of the Nobel prizes for a given year are not awarded. The way out for 1940 may be the "reserving" of all the prizes. Probably in present circumstances the funds that yield the equivalent of some $200,000 a year for the monetary awards that accompany the honors are none too safe.

In the last 40 years (the first Nobel prize was awarded in 1901) over $5,000,000 has been distributed in Nobel prize awards as a consequence of the bequest of Alfred Nobel, inventor of dynamite.

If the Nobel prize committees because of war conditions find that they can not operate, some temporary arrangements in the New World might be made to keep alive this great custom. The list of Nobelists is a singularly successful roster of scientific, literary and humanitarian immortals.

Nobelists in free countries might band together to aid the Nobel prize-awarding organizations carry on. The National Academy of Sciences and the Royal Society of London might lend their support to assuring an unbroken tradition, come what may.

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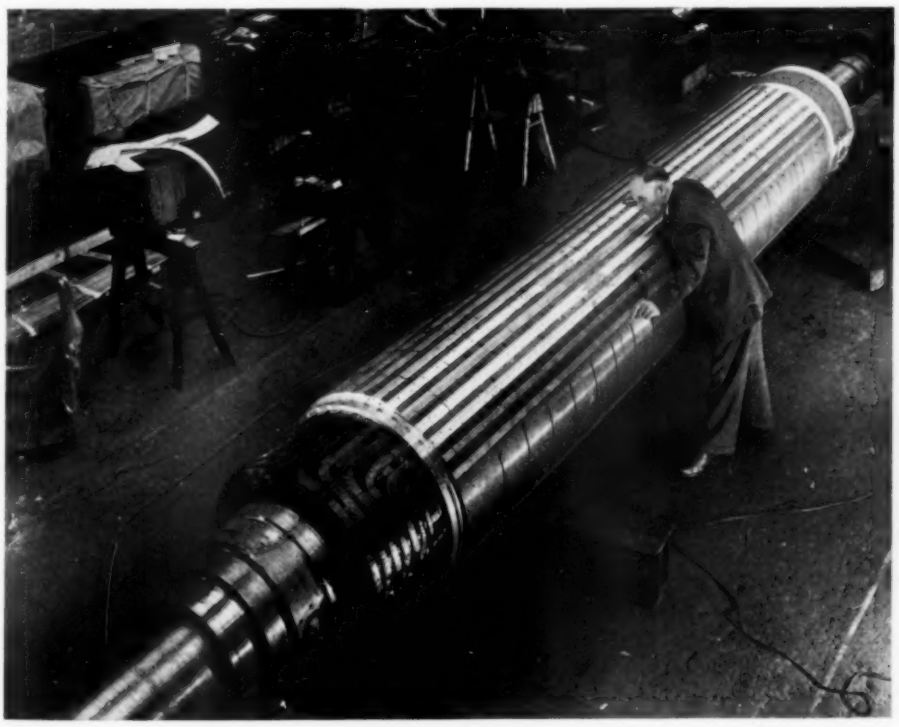

SLOTTED FOR SAGGING

Instead of fighting the tendency of long rotors to sag, the trick now is to let them go ahead and do it, controlling heretofore troublesome vibrations by judiciously placed crosswise slots.

ENGINEERING

"Let It Sag" Solves Heavy Rotor Troubles

BY LETTING them have their own way, Westinghouse engineers have overcome troubles that arose in heavy machines such as rotors of large, turbine-operated generators.

The big rotors, although made of steel, are so heavy that they sag about fifteen thousandths of an inch. This would not be troublesome if it remained the same, but it was found that the sag changed. The rotor was stiffer in one position than after it had made a quarter of a turn. Thus, when spinning 3600 times a minute, it shivered up and down, producing excessive wear.

The remedy was to cut additional slots, so that it would sag in all positions. The surrounding parts are designed to take care of this, and the trouble has been eliminated.

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Although Japan's relations with England are generally said to have begun in the nineteenth century, an English pilot, William Adams, reached Japan in a Dutch merchantman in 1600 and became diplomatic *adviser* to a Japanese official and married a Japanese woman.

NOTHING ABNORMAL

Early Stone Age people would not have made a "murder mystery" of this skull with a round hole evidently pierced by some heavy, pointed instrument, found in the upper cave at Choukoutien, China. It was apparently "natural" to die violently, in those days.

ANTHROPOLOGY

Violent End Was 'Natural' To Earliest Human Beings

VIOLENT death, so shocking to modern sensibilities, was the "natural" mode of exit from earthly existence to people of the Old Stone Age. This was true over 500,000 years ago, in the days of Peking Man, earth's earliest known humans, and it was true less than 50,000 years ago, in the later part of Paleolithic time.

Studies of Peking Man remains reported by Dr. Franz Weidenreich of Peiping Union Medical College support earlier findings by the French scientist Henri Vallois and extend the date of "natural" violent deaths back to the half-million year mark and beyond.

Dr. Weidenreich based his study on the 38 known Sinanthropus skulls, and on seven skulls of later Old Stone Age date found in upper levels in the same series of caves at Choukoutien. In both groups of skulls, the majority of specimens carry evidences of violence: they are either caved in, as by a club, or pierced, as by a spear or stone knife.

Life was short as well as full of trouble, in the old Chinese caves. Fifteen of the 38 Peking Man skulls were of children under 14 years old, as shown by state of dental development. Not all the adult skulls could be assigned ages because the material was so fragmentary. However, of those that could be provisionally dated, three appeared to be less than 30 years old, three between 40 and 50, and one patriarch appears to have been over 50—maybe as much as 60 years old.

Science News Letter, August 3, 1940

OCEANOGRAPHY

Water Pressure Helps Get Sea Bottom Samples

A NEW device for getting core samples from the ocean bottom, using the ocean's own depth pressure to drive the sampling tube into the mud, has been invented by Drs. Hans Pettersson and Borje Kullenberg of the Goteborg Oceanographic Institute in Sweden.

The first successful ocean-bottom core sampler was invented in the United States by Dr. Charles S. Piggot of the Carnegie Institution of Washington. This device employs a small charge of cannon powder to force a long tube into the bottom, cutting out a core or plug, exactly after the manner of a market-man's watermelon sampler.

Such cores, brought to the surface and taken to the laboratory, can be studied in great detail to learn the recent geological history of the ocean bottom.

The Pettersson-Kullenberg sampler uses a similar tube, but instead of loading gunpowder into the chamber at the top, merely exhausts the air from it. When the lower end of the tube touches bottom it automatically opens a valve which permits the great pressure of the water at depth to act against this vacuum, forcing the tube downward. The inventors hope to be able to obtain 30-foot cores by their new method.

Science News Letter, August 3, 1940

PHYSIOLOGY

Rumored "Pep Drug" Use By German Bombers Doubted

ARE GERMAN dive bombers drugged before the take-off, like horses before a race, to improve their performance?

Persistent though still unconfirmed reports state that they are and that the reports are the subject of scientific investigation in this country.

The "pep" medicines used for this drugging are said to be ephedrine, familiar to asthma sufferers, and benzedrine, known as "pep pills" to students who took them before examinations.

Scientific comment on the report is that even if true, it is doubtful if the "pep" chemicals would produce the desired results.

Both these chemicals raise the blood pressure. Many persons who have suffered from low blood pressure and been treated with ephedrine can testify to its "pepping up" effect. Benzedrine is useful in the sleep disorder, narcolepsy, because of its wake-up effect. This is what prompted college students to use it before examinations. Because benzedrine is a dangerous drug, medical authorities look upon its use in this way with disapproval.

At first glance it would seem that either or both of these might well improve the performance of dive bombers. To scientists, the catch is that there is little or no evidence to show that blood pressure is lowered during rapid descents from high altitudes. If the blood pressure is not significantly lowered, there would be no scientific reason for giving either ephedrine or benzedrine to raise it.

It might even be dangerous to give these medicines. They are extremely

powerful chemicals, safe when properly used in certain conditions. Their action, however, has been studied on animals and patients with certain definite ailments. So far as can be learned no studies have been reported which would show what their effects might be on a healthy dive bomber. Until such studies have been made, medical scientists would hesitate to recommend this use of the drugs for fear of possible disastrous results.

Science News Letter, August 3, 1940

PUBLIC HEALTH

Water May be Means Of Spreading Poliomyelitis

Swimming Pools Another Possibility; Chlorination May Not Give Protection Against Paralysis Virus

DRINKING water and the water in swimming pools may after all prove to be a means by which infantile paralysis is spread.

Fresh evidence strongly supporting this old theory, which scientists in recent years have discounted, is reported by Dr. J. Emerson Kempf and Dr. Malcolm H. Soule, of the University of Michigan (*Proceedings, Society for Experimental Biology and Medicine,* June).

Chlorination as now practised to make drinking water and swimming pool water safe does not kill the virus of infantile paralysis, the Michigan scientists have discovered.

"The possibility that drinking water, adequately chlorinated according to accepted standards, may be a factor in the epidemiology of poliomyelitis (infantile paralysis) must be recognized as a result of these findings," they state in their report.

"As a corollary, attention is directed to the shortcoming of this method for the protection of swimming pool water since carriers may discharge the virus from the intestinal tract or the naso-pharynx and the chlorine content of swimming pools is apt to drop significantly during peak bathing loads."

The discovery that the infantile paralysis virus can survive in chlorinated water was made after several other scientists had found the virus in sewage in the Charleston and Detroit epidemics in 1939. The infantile paralysis virus was also found in the intestinal discharges of healthy persons in contact with infantile paralysis patients in a Detroit institutional outbreak.

While this indicated that water could carry the germs in the same way that it can carry germs of typhoid fever, scientists did not believe that drinking water was a means of spreading the infantile paralysis virus. For one thing, big epidemics of the disease occurred in large cities with chlorinated and presumably safe drinking water. As recently as 1939 French scientists reported that chlorine in a concentration of four-tenths parts per million in tap water destroyed the virus.

In ordinary practise in this country, however, a residual chlorine content of one-tenth to two-tenths parts per million for one-half to two hours is considered adequate for the production of a safe water. The Michigan scientists have now found that "chlorine in a concentration of five-tenths parts per million, which is an amount in excess of that usually employed in municipal practise, did not inactivate the virus of poliomyelitis in one and one-half hours."

The idea that infantile paralysis could be spread by water is not new. Many persons are said to have been attacked by the disease after going in swimming. This method of spread, however, seemed unlikely to scientists after experiments which seemed to show that the virus of the disease is spread through the air and enters the body through the nerves of smell in the nose.

Drs. Kempf and Soule do not say in their report that the disease is not spread via air to the nose. They only show that the other method of spread via water is possible. They point out that more sensitive methods of detecting the virus of infantile paralysis in water are needed, and that because these are lacking, negative results of tests do not necessarily assure that the water is free from the virus. The germs of typhoid fever, for example, are seldom found by direct tests even though they may be present in the water supply.

The problem of finding a means of making drinking water free from infantile paralysis virus by treatment other than chlorination is probably the next one public health scientists will tackle. On this point the Michigan scientists say:

"Whether the aluminum hydroxide sedimentation process previous to chlorination would produce virus-free water cannot be answered in this paper."

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PHYSIOLOGY

Night Vision Sharpened By Drink on Previous Day

HERE'S a surprise for motorists accustomed to well-founded warnings of the dire results of drinking before driving an automobile:

A cocktail or other alcoholic drink might make driving at night safer by improving the driver's ability to see in the dark. The drinking, however, must be done 24 hours previously in order to be effective.

This possibility is seen as a result of tests showing the effect of alcohol on vitamin A in the body. Lack of this vitamin, obtained from such foods as butter, egg yolk and carrots, leads to night blindness. Vitamin A lack can be determined either by special eyesight tests or by blood tests.

With the blood tests, Dr. S. W. Clausen and associates of the University of Rochester School of Medicine discovered that giving dogs two ounces of alcohol in water promptly increased the amount of vitamin A in their blood.

The same thing happens to humans, Dr. L. B. Pett, of the University of Alberta, now reports. Dr. Pett has been making daily eyesight tests for vitamin A on many people during the past two years.

"On several occasions unaccountably short recovery times (indicating higher blood vitamin A levels) have been observed the day following the taking of alcohol," he reports (*Science,* July 19).

The alcohol apparently mobilizes the vitamin A from its storage place in the body, presumably the liver, getting more of it into the blood for distribution to other parts of the body, including the eyes where it is needed for normal vision and for preventing night blindness. Dr. Pett's visual tests show that the vitamin not only gets into the blood under the influence of alcohol, but into the eyes where it improves ability to see in the dark.

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The United States now makes 96% of its *dyes.*

GEOGRAPHY—HISTORY

America Invaded!

But the Marches of Coronado and De Soto, 400 Years Ago, Were Slow-Motion Campaigns, Not Modern Blitzkriegs

By EMILY C. DAVIS

WHILE gigantic armies reshuffle Europe, the United States is celebrating through a romantic haze the 400th anniversary of invasion of these shores by two Spanish armies, led by Ferdinand de Soto and Vasquez de Coronado.

Re-tracing the advance of gold-seeking conqueror Coronado and his nobles, who came riding up from Mexico in 1540, modern Southwesterners are enacting a progressive pageant. Before summer is over, they will have acted Coronado's adventures at about 20 points along the 400-year-old route in New Mexico, Arizona, and Texas.

Taking up the saga in 1941, Kansas plans to celebrate arrival there in 1541 of the roving invaders, in quest of elusive rich Indian cities.

New Mexico is making 1940 Coronado's year. Scientific meetings will dedicate their discussions to Spanish and Indian archaeological and historical problems. Art exhibits and gatherings of writers will feature Coronado's times. All events memorialize a man who made a tremendous pioneering journey and who ironically was rated pretty much of a failure by those in Mexico to whom he reported the gloomy news: no gold.

DeSoto Route Marked

Less widely publicized thus far, the Southeastern States' celebration of De Soto's 1539-1542 journey for gold and conquest will last through 1942. The meandering route of De Soto will be marked officially, according to scientific verdict as to most likely landmarks. Local programs are also planned.

As outstanding memorial, a forest honoring De Soto near the place where he reached the Mississippi's waters is provided in a bill before Congress. The Forest of Repentance, Congressmen propose to call it, since the verdant Mississippi Valley which De Soto discovered has been, in terms of the bill, "the victim of reckless exploitation on the one hand and appalling neglect on the other." The forest and a memorial building would remind Americans of importance of conserving America's forest wealth.

Sharp contrast in invasions is offered by these military ventures of the sixteenth century versus present day Nazis.

Roaming thousands of wilderness miles, tiny Spanish armies fought tiny battles with holders of the land.

What De Soto called his army totaled about 600 soldiers. Some 250 rode horses. Servants with supplies, including lively and reluctant pigs, trailed along.

Coronado moved up from Mexico proudly leading 200 Spanish dandies in velvet and shining armor, 70 foot soldiers and about 1,000 Indian allies. He also was accompanied by livestock.

With such armies—small indeed by modern military standards—Spain laid hold on one-half of the United States.

Half of U. S. Claimed

Politically it was done this way:

Coronado, commanded to extend Spain's dominion north of Mexico and to plant colonies, claimed in vague gestures, as he advanced, land now comprising one-third of the United States.

Another sixth of present United States territory became more firmly Spain's by De Soto's commission to conquer and colonize Florida. Ponce de Leon had already planted the Spanish flag on the Florida shore, but how far "Florida" spread or what lay inland beyond the limited explorations of Ponce de Leon was for De Soto to prove.

Total for Spain from these military and colonizing ventures: one-half of our three-million-square-mile land.

Pitted against armor-clad invaders, the Indian Americans proved feebly unready. They were too scattered, too bewildered by firearms, too ignorant of political forces marshaled against them.

The largest city in the United States was—imagine it!—Pecos in New Mexico.

This Indian pueblo boasted nearly 500 warriors and liked to tell that it had never been defeated. But facing the glitter and authority of Spain, Pecos did not fight. It welcomed Coronado in with drums and pipes and gifts of turquoise and cloth.

Later, regretting the hospitality, Pecos tried fifth column tactics in reverse. An Indian nicknamed the Turk was persuaded to lure these gold-hungry foreigners away to the northeast, by promising to show them Gran Quivera, a city of silver and gold.

When Indian towns greeted Coronado with arrows, Spanish arquebuses and crossbows replied effectively. Even though the Pueblo settlements and roving Indian bands had little to tempt treasure hunters, the Spaniards had the duty of conquering for Spain, and also the priestly mission of introducing Christianity for the first time north of the Rio Grande.

Curiously, considering the vast achievement of this pioneering journey, Coronado's return to Mexico was dejected and sheepish. No riches to match those of the Incas in Peru and the Aztecs in Mexico had been found. The alluring "Northern Mystery" was no mystery now. The Seven Cities of Cibola had no golden dwellings, no children playing in the street with precious stones. Cibola was a land of plain Indian farmers, swarming in queer towering masses of dwellings. The golden Gran Quivera of the Kansas plains was worse—a land of native hunters living in tipis.

De Soto fared as badly as Coronado in finding no gold. Beset by hardships and sufferings, his men roved from one Indian town to another through Georgia, the Carolinas and hither and yon to the Mississippi River and then beyond into Arkansas. A nightmare journey, yet a tremendously eventful one.

Mech-e-se-be River

De Soto explored a huge area, climaxed by discovering the great river Indians called Mech-e-se-be, Father of Waters. Technically, one explorer had reached the Mississippi before, at the mouth. But De Soto remains "the discoverer" since his expedition led to opening and settlement of the Mississippi Valley.

Pigs that won freedom from De Soto's herds, and horses turned loose by Coronado when forage was scant, were historic animals, for they established pigs in the Southeast and horses in the Southwest. De Soto's horses did not play any part in America's livestock history, it is generally believed. His horses were all killed, and none escaped to rove Southeastern country. Nor did any of Coronado's sheep remain to start Indian herds in the West. Modern Navajo sheep are descended from Spanish flocks brought in 1598.

First white men to view the wonder of the Grand Canyon were a detachment of Coronado's army. They said the cliffs were taller than Seville Cathedral.

Roaming so vast a country, it is curious that the two expeditions came to points within a couple of hundred miles, probably, of one another. Not at the same time, though. Some historians think that Coronado in 1541 got as far east as Palo Duro Canyon in the Texas Panhandle. And Moscoso, succeeding to leadership of the De Soto party in 1542, when the leader died by the shores of the Mississippi, attempted an exit march westward toward Mexico. Part way across Texas, Moscoso turned back, discouraged. The remnant of De Soto's army ultimately made its exit by boat down the Mississippi and thence to Mexico.

A tough problem for archaeologists and historians is the task of trailing the Spanish conquerors, 400 years late. Chronicles and diaries were kept by the Spanish expeditions, and certainly these were not meant to prove confusing to readers. But many tribes, and towns, and even topographical landmarks have vanished or changed in 400 years.

Leading authority on the route of De Soto, Dr. John R. Swanton of the Bureau of American Ethnology, has charted what he regards as the most likely route, from present knowledge. Dr. Swanton's special interest in the De Soto route was aroused by Col. John R. Fordyce, of the Arkansas Historical Commission. Col. Fordyce paced out portions of De Soto's journey, figuring each day's march and checking his computations by landmarks and Indian sites.

Doing similar duty for Coronado, Prof. Herbert E. Bolton of the University of California has this year been re-traveling the uncertain portions of the Southwestern explorations. The Kansas and Texas detour of the Coronado party is particularly hard to chart.

Locating the neighborhood where Coronado stood in Mexico and caught his first glimpse of the United States required a special scouting expedition last spring. The most likely point—at the southern end of the Huachua Mountains in the area of Montezuma Pass and Yaqui Springs—is the selected place for a $10,000 monument. Like De Soto discovering the Mississippi, Coronado was not strictly the first white man to discover the United States from the Mexican angle. A scouting party had preceded him. But Coronado, in the world's mind, rates as the discoverer.

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LINES OF MARCH

Coronado from the southwest and De Soto from the southeast covered a large part of the southern half of this country in their wanderings, unrewarding in the treasure they sought but rich in historic importance.

● RADIO

Frederic G. Melcher, editor of Publishers Weekly, John F. Cuneo, president of the Cuneo Press, and Harvey D. Gibson, chairman of the board, New York World's Fair, will discuss "Five Hundred Years of Printing," as guest speakers on "Adventure in Science" with Watson Davis, director of Science Service, over the coast to coast network of the Columbia Broadcasting System, Thursday, Aug. 8, 4:00 p.m., EDST, 3:00 EST, 2:00 CST, 1:00 MST, 12:00 PST.

Listen in on your local station. Listen in each Thursday.

EARLY INVADER

Portrait of De Soto, one of the two first white men to "invade" what is now the United States. Apparently no contemporary likenesses of Coronado have survived.

CHEMISTRY

Self-Washing House Paint Contains Titanium Oxide

HOUSE paint containing titanium oxide literally washes itself under the action of wind, rain and sun. It does this by accumulating a fine powder on its surface. As dust and dirt from the atmosphere settle on this surface, they are readily washed away by wind and rain, exposing fresh, clean paint. Only a minute amount of paint is removed each time, so the finish is left well protected.

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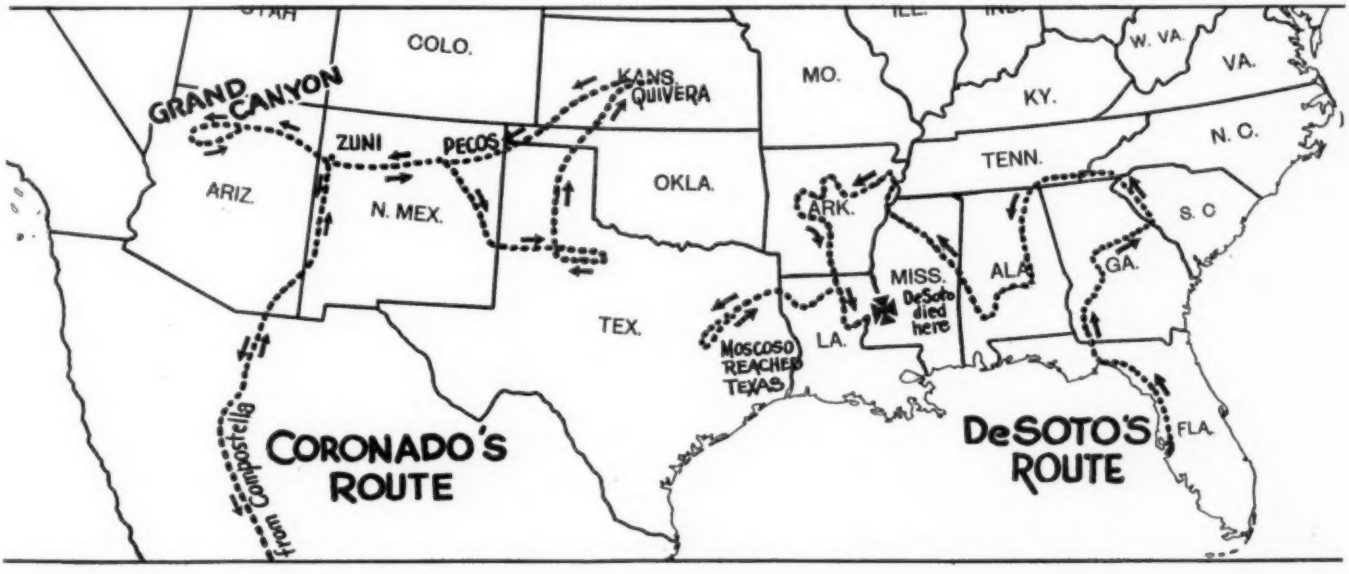

BOTANY

Better Grasses Sought For Venezuela's Ranges

VENEZUELA, like the United States, has a grass problem on its hands. An American woman botanist, Mrs. Agnes Chase, has been loaned to the southern republic by the Smithsonian Institution, and has just returned after two months in the field as guest of the Venezuelan Republic.

Venezuela's grass problem is very much like that of our own Plains region: to find suitable species, native or imported, that can be used to greatest advantage in re-developing its drought-afflicted, windswept rangelands, so that they may again become able to support great herds of cattle and flocks of sheep and goats.

In addition to her two months' survey, Mrs. Chase has offered a recommendation that a Venezuelan botanist be sent to the United States for advanced studies that will enable him to continue the work she initiated. Under her supervision at the U. S. National Herbarium in Washington, D. C., is the world's greatest collection of grass specimens, and other American herbaria afford additional opportunities for exact scientific studies on these most important of all plants.

Science News Letter, August 3, 1940

INDUSTRY

U. S. Employment Offices To Clear Defense Jobs

UNCLE SAM wants to get in touch with you if you are a worker in one of the 270 jobs important to national defense.

Are you a draftsman? A mechanical engineer? A form carpenter? Machine shop or foundry bench hand? Electrical assembler? Chain maker (jewelry)? Maintenance electrician? Lens grinder? Electrical instrument maker? Watch machinist? Refrigerating machine operator? Parachute packer? Sewing machine repairman? Typewriter service man? Or an armorer? Or even a farrier or blacksmith?

Do you want a job in one of the important defense industries?

Then go right away to your nearest public employment office and register. If you are trained in any other sort of work that you think may be included in the long list of "selected occupations" make a trip to the employment office and ask whether your job is included.

This information is needed by Uncle Sam for a count now in progress. The registration is for placement in private industry at regular pay.

Here are the industries that are considered essential for defense: Aircraft manufacturing, maintenance and repair. Machine tools. Shipbuilding manufacturing, maintenance and repair. Automotive manufacturing, maintenance and repair. Electrical. Forging. Boiler and heavy steel plate. Foundry. Light manufacturing. Sheet metal. Woodworking. Chemicals. Ammunition. Ordnance, light and heavy.

Training programs are already under way to fit workers for jobs in these essential industries. Selection of individuals for this training is also being made through public employment offices.

Science News Letter, August 3, 1940

BIOCHEMISTRY

New Digestive Enzyme Found in Horse Nettle

A PROTEIN-digesting enzyme, resembling pepsin in its action, has been found in the troublesome weed known as horse nettle or bull nettle by two University of California scientists, Dr. Davis M. Greenberg and Theodore Winnick. It is even more like the digestive compound found in the subtropical fruit papaya, known as papain, and because the weed's generic name is *Solanum,* the newly discovered substance has been given an analogous name, solanain.

Papain has long been used as a medicine for indigestion, and it is regarded as possible that solanain may prove useful in the same way. It may also find economic application in tanning and other industries.

Solanain is more resistant to heat than other digestive enzymes. It can stand temperatures up to 80 degrees Centigrade without losing its digestive powers, and it is also resistant to certain destructive chemical treatments.

Curiously enough, Southwestern Indians have long made use of the weed's protein-digesting ability without having any inkling of its scientific basis. They have used the juice of the berries to curdle milk into a kind of cheese.

If it becomes desirable to cultivate horse nettles as a source of enzyme for medical or industrial use, there need be no worry about supplies. The weed is widespread in this country, and is rated as one of the worst cornfield invaders in the Midwest. Not even pigs will eat it, because of its long, sharp thorns and its bitter taste.

Science News Letter, August 3, 1940

IN SCIENCE

WILDLIFE

Cancer Attacking Grouse In British Columbia

CANCER is attacking the grouse in British Columbia, Dr. Ian McTaggart Cowan, of the Provincial Museum, Victoria, B. C., reports (*Journal of Wildlife Management,* July).

Specimens of grouse with some unknown but apparently malignant growth on their heads, threatening to make their eyes useless, were brought in by hunters. Microscopic examinations of tissue sections were made by Dr. G. A. McCurdy, pathologist of the Royal Jubilee Hospital. He diagnosed the growth as "low grade papillary carcinomata."

"The presence of this disease in epidemic proportions in a localized area suggests that it is contagious," Dr. Cowan states. "It seems probable that the causative organism is a filtrable virus and that transmission is by biting flies."

Science News Letter, August 3, 1940

ASTRONOMY

Model of 200-Inch 'Scope Shown at Golden Gate Fair

See Front Cover

A WORKING model of the new 200-inch telescope being erected by the California Institute of Technology on Mt. Palomar, one-tenth the size of the original, and built at a cost of $25,000, has been placed on display at the Golden Gate Exposition. The model, with its 20-inch mirror and all necessary auxiliary attachments, is a complete telescope, and has been used for more than a year in actual observations.

The model is part of the exhibit of the Westinghouse Electric and Manufacturing Company, which built the mounting for the telescope itself. Weighing about a million pounds, the great instrument is now in place in southern California, but will not be used until the completion of the 17-foot concave mirror which will gather the rays of starlight. Many months, at least, will elapse before this is ready, since the process of grinding and figuring to the correct curve is a long and delicate one.

Science News Letter, August 3, 1940

NCE FIELDS

MEDICINE

Andy Gump Chins Made Normal by Operation

ANDY GUMP chins, which are the subject of many jokes and much mental anguish, depending on whose face finishes in a badly receding chin, can be built out to normal and even handsome proportions by bone and cartilage grafting operations.

Details of such operations are reported by Dr. Gordon B. New and Dr. John B. Erich, of the Mayo Clinic (*Journal, American Medical Association,* July 20). In some cases the operation involved not only grafting of extra bone to increase the jaw but also plastic operations and implantation of false teeth in front of the patient's own, to give a normal appearance to lips and mouth as well as chin.

Improving the patient's appearance is not the only benefit possible from such operations. In most of these cases, the teeth do not meet normally and in cases where this is very marked it may interfere with chewing. Some operations may correct this difficulty as well as the defect in appearance.

Science News Letter, August 3, 1940

PHYSICS—RADIO

Uranium Energy Opens New Radio Station

THE MINUTE amount of energy released by the splitting of an atom of power-producing Uranium 235 was put to work in Boston on the night of Saturday, July 27, when it turned on the new fifty kilowatt transmitter of Westinghouse radio station WBZ.

Uranium, a heavy brittle metal, exists like other elements in several forms, or isotopes. The one of atomic weight 235 has recently been isolated in microscopic amounts. Studies made at several laboratories have led to the suggestion that if large quantities of U-235 could be secured, the world might have a practicable source of atomic power, which has long been sought.

The switchover from the present station in Millis to the new one at Hull, across the harbor from Boston, took place during a broadcast over the NBC-Blue network. Apparatus for the atom-splitting experiment was located at Hull, under the control of Dr. E. U. Condon, associate director of the Westinghouse research laboratories at East Pittsburgh, Pennsylvania.

The splitting of the atom was heard by the radio audience as a sharp click. After two preliminary splittings, to acquaint listeners with the sound, the third one operated relays to switch from Millis to Hull.

The increased strength of the new station does not come from increased power, for this is the same (50 kilowatts) as the old one. According to Vincent F. Callahan, general manager of WBZ, it is due to the directing antenna. This reflects waves that would otherwise be wasted over the Atlantic Ocean and sends them back to reenforce those supplying the densely populated area around Boston. It consists of two 500-foot towers, one of which is the director, and the other the reflector. Located on the salt marsh of Hingham Bay, it takes advantage of the ideal properties of salt water in carrying ground waves.

Science News Letter, August 3, 1940

VITAL STATISTICS

Suicide Rate More Than Doubled, Census Shows

MORE THAN twice as many persons commit suicide nowadays as did in 1920, U. S. Census Bureau figures just released for the 18-year period 1920-1938 show. The Census Bureau does not tell why. It is their job to report the figures.

Total number of suicides in the registration area of the United States for the year 1938, latest figures available, was 19,802. For the year 1920 it was 8,959. For the entire period, the nation's total of suicides was 300,580. The rate for 1938, 15.2 per 100,000 estimated population, was the highest since the depression period, when the all-time high rate of 17.4 per 100,000 was recorded in 1932.

Of the States, Nevada reported the highest suicide rate per 100,000 estimated population in 1938 with 35.6; South Carolina reported the lowest rate with 6.7. In total number of suicides in 1938, New York led all the States with 2,248, while Nevada reported the smallest number with 36 suicides. California ranked second in total number of suicides in 1938 with 1,874; Pennsylvania third with 1,397; Ohio fourth with 1,274; and Illinois fifth with 1,271 suicidal deaths.

Science News Letter, August 3, 1940

RADIO—AVIATION

Lines on Radio Map Show Exact Location of Plane

TWO CROSSED white lines on a map indicate to an airplane pilot his exact position, with a new invention which has just received U. S. Patent 2,209,191. The inventor is John B. Dearing, of Ben Avon, Pa.

Radio compasses previously used on airplanes and ships give in numbers the direction, or bearing, of a selected transmitting station. Thus, the pilot can find the direction of two separate stations whose positions are known, mark these on a map as lines passing through the location of the transmitters. The intersection of these lines is the position of the aircraft.

To do this automatically is the purpose of Mr. Dearing's invention, the patent rights of which have been assigned to the Radio Corporation of America. Two radio receivers tune in the two stations, on a loop antenna, which responds best when the station is in the plane of the loop. The antenna rotates, and as it does so the intensity of the signal varies in strength.

The receivers control two beams of cathode rays, in a vacuum tube, which fall on a screen similar to that used in television receivers. The beams oscillate back and forth, tracing out two lines on the screen, and the direction of the lines depends on the bearings of the stations. By a small magic lantern incorporated into the device, a map is projected from a film on the same screen. Thus, the pilot sees the map, with the two bright lines, superimposed. Their intersection shows his location, which changes as he flies along.

Science News Letter, August 3, 1940

INVENTION

New "Note Finder" Helps Music Teachers

AN AID to music teachers is the recently patented "note finder," consisting of a panel marked with the bass and treble clefs and the usual staffs. By means of an endless cord, running over a roller behind the chart, a note can be moved up and down to various positions.

It can be used in two ways. Either the teacher can set the note, and the pupil name or sound it, or it can be operated by the child, who sets it to the note named or sounded by the instructor.

Science News Letter, August 3, 1940

CLIMATOLOGY

Severest Heat Waves Come After Sun Starts Southward

Lag in Temperature Climax Varies According to Region; Greatest on Pacific Coast, Least in Interior States

IF IT IS any comfort to you, these sweltering days, the sun's light and heat rays are not as concentrated as they were at the time of the summer solstice, June 21.

It is quite all right to feel hot, nevertheless. This is the time of year when normal temperatures are highest, according to the weather men.

On June 21, the summer solstice, the sun was farthest north. Then, in countries on this side of the tropics, it was highest in the sky and its heat and light rays alike were falling on the ground mostly nearly vertically. Therefore, they were most concentrated. Their heating effect was greatest.

Yet the summer solstice was not the hottest time of year. Here's why:

All day long, the rays beat on the earth, and it becomes hotter. All night long, if it is clear, the earth radiates this heat out again into space. In June, with long days and short nights, the amount of heat taken in during the long days was considerably more than that given off during the short nights.

Even after the solstice this condition continued, despite the fact that the sun moved southward in the sky, and its rays, falling on the ground at a lower angle, were less concentrated. Thus the temperature of the earth continued to rise. Not until July or August is there a balance, with amount of heat radiated at night the same as that received during the day. After that, the nocturnal radiation is greater, and average temperatures begin to drop.

Local conditions, naturally, affect this. If there happens to be a series of hot days and cloudy nights, the heat becomes greater than ever, because clouds blanket the earth, and reduce the nightly cooling. Most to be desired are cloudy days and clear nights. The former reduce the heat received from the sun, while the latter permit the heat to escape as usual.

Edward H. Bowie, in charge of the U. S. Weather Bureau at San Francisco, has made a study of the delay in hottest weather in various parts of the country. This shows that in southern Arizona and New Mexico, highest normal daily temperatures come only ten days after the solstice. Around the coast of the Gulf of Mexico, the delay is 40 to 50 days. Along the North Atlantic coast it is about 40 days, but about a hundred miles inland it is only 30 days. In the Central States it is about 30 days.

Along the Pacific Coast, the delay is greatest, about 100 days at San Francisco, but this lag drops very rapidly away from the ocean. At Sacramento, less than 100 miles inland, it is 37 days. Dr. Edgar W. Woolard, of the U. S. Weather Bureau, who has carefully studied these time lags, attributes the great delay to the prevailing westerly winds that blow in from the cool ocean surface. The proximity of water along the Gulf and North Atlantic coasts makes the delay greater than in the dry Southwest. Dr. Woolard states, however, that not all the delays are fully explained.

It is on account of these facts that the summer solstice on June 21, when the sun is farthest north, is considered the beginning of summer rather than its middle. If temperatures depended solely upon the sun, it would be just as hot a month before the solstice as a month after it. In reality, warmest weather arrives some time after the solstice, so the highest temperatures come approximately in the middle of the three months following the solstice.

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PHYSIOLOGY

Eating Fats and Candy Improves Golf Scores

GOLFERS, especially poor players, who get tired and begin to pile up a high score between the ninth and fifteenth holes in a foursome or between the eleventh and the fifteenth in a twosome, are advised to eat more fat foods for lunch and take some sugar or candy near the seventh or ninth hole. The advice comes from Dr. Paul Michael, of Oakland, Calif., (*Journal, American Medical Association,* July 27).

The idea comes from previous findings that marathon runners who are sustained by sugar come through a race with less fatigue.

Comparatively few persons run in marathons or other races, but more than 2,000,000 golfers play on 3,000 courses in the United States, so Dr. Michael decided to investigate the possibilities of helping this large group of sportsmen and women through diet studies.

Blood tests showed that following usual luncheons and playing under ordinary conditions, the sugar in the golfers' blood dropped below normal between the ninth and fifteenth holes in a foursome and between the eleventh and fifteenth holes in a twosome. This corresponds to the periods when the golfers made the greatest number of poor shots, felt most tired and had the highest scores.

The poorer golfers had even less sugar in their blood in many cases "because of the fact that they expended more energy in playing the game and showed greater signs of exhaustion."

Getting upset over their poor shots at this period made the condition worse. The more composed and accomplished players did not have as low a level of sugar in their blood. When the golfers ate more fat foods for lunch and took candy or sugar at the seventh or ninth hole, they did not feel so tired or nervous and, on the whole, had better scores.

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CHEMISTRY—MEDICINE

Synthetic Malaria Drugs Sought by New Committee

DEVELOPMENT in the United States of new synthetic drugs for malaria, vitally necessary if war shuts off the supply of quinine from Java, is the first objective of the newly announced committee on chemotherapy of the National Research Council. Dr. Marston T. Bogert, Columbia University, is chairman of the committee.

"While quinine, plasmoquine, atebrine and a few other drugs have been useful, there is, in the judgment of the medical profession, great need for something better," the committee states. "The present remedies leave much to be desired from a therapeutic point of view and the price is higher than many can afford to pay."

Discovery of synthetic chemicals for treating other diseases besides malaria will be encouraged by the committee, although the antimalarials will be given first attention.

Science News Letter, August 3, 1940

ANTHROPOLOGY

Excessive Gum-Chewing May Cause Bony Growths on Jaw

WATCH OUT, you gum-chewing sisters!

If you pursue your soothing masticatory addiction with excessive assiduity you may become liable to mandibular hyperostoses.

Translated into English, that means if you keep up your cud-chewing too long, you may get bony growths on your jaw.

At any rate, that's what Dr. Ales Hrdlicka, Smithsonian Institution's veteran anthropologist, says can happen. Dr. Hrdlicka has been making a study of about 5,000 lower jawbones from the Institution's vast collection of ancient and modern skulls, and finds bony outgrowths from the inner jaw surfaces fairly frequent, and widespread in both space and time. Some of these growths are tuberculate ("lumpy"), others are ridges. They are almost like bony tumors, except that the bone appears to be strong and perfectly healthy.

First suggestion, that these growths represent an evolutionary "throwback", is set aside because ancient human and pre-human skulls do not show them. They are not found on Neandertal jaws or on the jaws of fossil or existing great apes. They appear only on jawbones of modern man, and are slightly more frequent in men than women.

Most plausible explanation is that the growths are responses to muscular pull on the bones, due to chewing hard on tough, resistant foods. Especially significant, Dr. Hrdlicka feels, is their relatively high frequency among the Eskimos. Also, they were more common on the jaws of early Norse settlers in Iceland and Greenland than they were in the Scandinavian homeland.

Asked about possibilities of results from the modern habit of gum-chewing, Dr. Hrdlicka stated, "That question may not be as frivolous as it sounds. True, gum isn't tough, and it requires very little exertion to chew it. But the advanced gum addict chews and chews and chews, hours on end sometimes, so that the sum total of exertion on the part of the jaw muscles may easily amount to as much as a smaller number of harder bites on a tougher substance.

"Of course, since these bony growths I have been studying all appear on the inner jaw surface, there isn't any direct danger of their spoiling a girl's face for her. However, constant exercise of the muscles outside of the jaw can give a lumpy appearance, especially when the gum-chewer develops the rather common habit of doing all of her chewing on one side."

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MME. CHANTECLER

The classic fowl immortalized in Rostands' masterpiece was Brother Wilfrid's inspiration in naming the poultry breed he originated. This, of course, is a portrait of Madame Chantecler.

GENETICS

New Breed of Poultry "Made to Order" by Monk

CHANTECLER is the name of a breed of poultry especially adapted for Canadian conditions. The story of its origination is an interesting chapter in the history of genetics as applied to everyday farmyard problems, going back for more than thirty years.

The breed was literally made to order. There was a definite picture of what the future fowl should be like, long before the first chick of the new variety pipped its shell. The breed must be hardy, to withstand Canadian winters. It must be plump, for meat, and a prolific egg producer. It must be fine-boned and white, for attractive appearance.

Starting in 1908, Dark Cornish and White Leghorn were crossed, for the first female ancestor, and Rhode Island Red with White Wyandotte, for the first male. A couple of years later, White Plymouth Rock was added to the strain, and still later further infusions of White Wyandotte and White Plymouth Rock were introduced. By careful application of Mendelian principles, the breed was made to conform exactly to specifications.

The Chantecler breed was brought to perfection by Brother Wilfrid, a Trappist monk, at the Oka Agricultural Institute. There is a mild note of irony about this. Hens, as is well known, are among the most conversational of all animals. Trappists, it is equally well known, save themselves no end of trouble by not conversing at all. Perhaps Brother Wilfrid sees the joke. He isn't saying.

Science News Letter, August 3, 1940

CHEMISTRY

New Acid Dispenser Useful in Laboratory

A NEW acid dispenser will prove of great use in chemical laboratories. It is made of glass and attached by a plastic adapter to a standard 5-pint screw cap acid bottle. Squeezing a rubber bulb charges a graduated cylinder above. Then any desired quantity of acid may be accurately drawn off by opening a stopcock.

Science News Letter, August 3, 1940

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ORDNANCE

New Front Sight Improves Garand Semiautomatic Rifle

Severe Tests in Actual Service Demonstrate Weapon's Ability to "Take It"; Advantages, Drawbacks Compared

A NEW FRONT sight for the Garand rifle has just been patented by its inventor, John C. Garand of the U. S. Arsenal at Springfield, Mass. The patent (No. 2,208,576) has been assigned to the United States of America, as represented by the Secretary of War. Advantage of the new sight, aside from simplicity of manufacture and ease of installation, is the readiness with which it may be offset from the true center line of the barrel, to allow for the drift of the bullet caused by the spin of the rifling.

In the meantime, practical field tests of the Garand rifle, now known officially as U. S. rifle, caliber .30, M1, are being reported by commanding officers of infantry units that have been giving it "the works." Satisfactory performance under the hardest conditions is reported in the hands of both veteran and untrained troops. Commenting editorially, *Army Ordnance* remarks, "When a test weapon receives a diploma from the school of the doughboy, it is truly fit for the wars."

Brig. Gen. Karl Truesdell, commanding the First Division, balances advantages and disadvantages of both the M1 and the Springfield model 1903 rifles. The former, he says, has the great advantage of very rapid fire, especially for anti-aircraft action. Its recoil is light, making it easier to instruct recruits in its use. Much less fatigue is experienced in sustained fire. Eight cartridges to the clip, instead of five, saves much time in reloading.

The Springfield has the advantage of being a more accurate rifle for target-range purposes. The five-cartridge clip is lighter and easier to handle. Maintenance is simpler.

As disadvantages of the Garand rifle, Gen. Truesdell mentions the temptation to use up ammunition too fast, due to the rapid, semi-automatic firing; lower accuracy at ranges beyond 500 yards; and the necessity for the soldiers to load their own clips.

As principal disadvantage of the Springfield Gen. Truesdell cites greater fatigue due to the necessity of working the bolt for each shot, and especially the fact that this hand loading throws the sights off the target every time.

One thing that is not forgotten, even while praising the new semi-automatic rifle, is that the Springfield '03 model is still decidedly the best bolt-action military riffle in the world, considerably superior to any weapon now being used by European armies. To sum it up, the U. S. Army is discarding the world's best infantry rifle for one that is still better.

New Trench Mortars

The Army's new trench mortars, handy weapons which the infantry can carry right up with the first wave of attackers to do part of their own artillery work, can be produced rapidly and cheaply from standard seamless steel tubing, Capt. Daniel J. Martin, U. S. A., points out (*Army Ordnance,* July).

Not only the tube of the weapon itself but the shells it fires can be made in this way. This rapidity and economy in procuring an important weapon and its ammunition are regarded as having particular significance in the present emergency preparedness program.

Shells for the new-type trench mortars are given a streamline shape in special presses, and fins are fitted at the tail to keep them from tumbling in their flight and losing accuracy. In this they contrast strongly with the old Stokes mortar shells of First World War days, which were ordinary straight-sided artillery projectiles. Although the Stokes mortar was effective, especially as a defensive weapon against mass attacks of infantry, its lack of accuracy left much to be desired.

For this reason, post-war experiments were undertaken by a French ordnance officer named Brandt, who evolved the present streamlined, fin-tailed projectile. The U. S. Army acquired American rights to the Brandt patents and has made improvements in both the weapons and their ammunition.

As developed in recent years, trench mortars belie their name. They are not intended primarily for use in trenches, but as light weapons that can be carried up into combat by advancing infantry, or on scouting expeditions by mechanized cavalry, to blast out stubbornly held machine-gun positions. They can be carried in trucks or other vehicles, or across rough terrain by the men themselves.

Two calibers have been adopted as standard for the U. S. Army: 60 millimeters (2.36 inches), throwing a 3-pound shell to an extreme range of 750 yards; and 81 millimeters (3.15 inches), throwing either a 14.5-pound shell 1280 yards or a lighter, 7.6-pound shell 3280 yards.

The little 60-millimeter mortar should be the doughboy's pet, for it is so light (39 pounds altogether) that one man can pack the whole weapon. The 81-millimeter piece has an assembled weight of 134 pounds, and comes apart into three fairly hefty backloads.

Trench mortars are smoothbore weapons, and depend on the projectile's tail-fins to maintain smooth and accurate trajectory. They are fired at high angles (always more than 45 degrees) and use very small powder charges. The normal charge is loaded into a cartridge like a shotgun shell, fixed to the base of the projectile. This is dropped down the barrel, and as it strikes bottom the explosive cap makes contact with an upward-projecting pin. With a muffled "Pung!" the shell promptly comes out again and sails away toward its target in a high arc.

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Flashless and Smokeless

When the new powder plants, to be built near Louisville, Ky., by the government and operated by du Pont, begin to turn out their 200,000 pounds per day, more than tripling the nation's existing output, they will be making a propellant that is markedly superior to the powder of World War days.

The standard U. S. Army powder is now flashless as well as smokeless. And it does not absorb moisture that interferes with the accuracy of fire.

Intensive research begun in 1919 by the Ordnance Department and private manufacturers resulted in the production in 1924 of a flashless non-hygroscopic smokeless powder for the 75 mm. gun. Since then there have been perfected satisfactory powders for use in the larger 155 mm. gun, using about 25 pounds per charge, as well as in all lesser calibers.

With ordinary smokeless powder there is a blinding flash that allows the enemy to spot the gun, day or night, almost as easily as if the gun belched forth smoke. Over half of the gases produced by the combustion of smokeless powder in a gun are combustible, largely carbon monoxide and hydrogen. The flash beyond the muzzle occurs spontaneously when these hot gases mix with oxygen of the air.

During the World War the Germans added potassium chloride and common salt to their powder to reduce flash. The French added a little vaseline. American practise was to add a cooling agent to standard service powder in a separate cloth bag or packet. These were only partially effective as to flash and did not prevent absorption of moisture. The present U. S. Army flashless powder has flash reducers, waterproofing agents and non-volatile colloiding agents mixed with the nitro-cellulose of the powder.

The U. S. powder is entirely flashless. At night there is a small dull-red glow for a short distance in front of the muzzle, but it fails to register on photographic plates. Besides keeping the gun's location a secret from the enemy, lack of flash relieves the gun crew of being temporarily blinded every time the gun is fired.

Even the "bang" of guns using the newer flashless powder is reduced. The gas explosion in front of the muzzle is eliminated and the noise of the gun consists only of the sound of the sudden release of the gases from the muzzle. This makes it difficult for the enemy to locate the gun by use of sound ranging.

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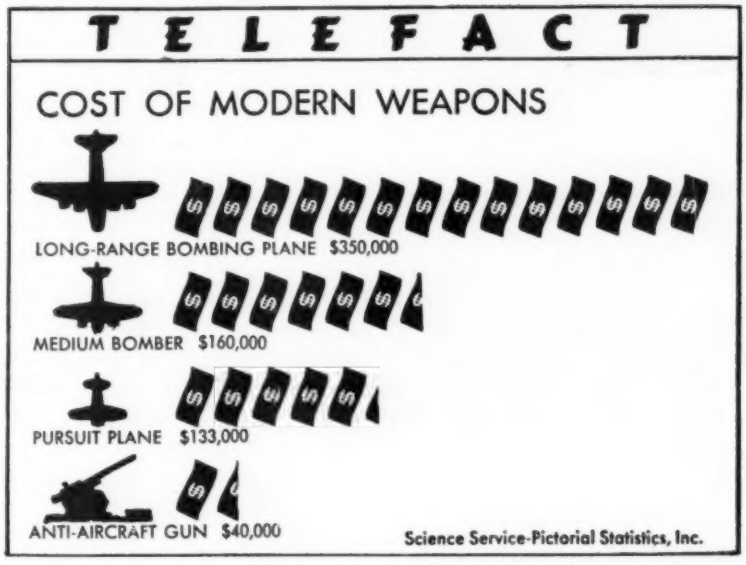

Science News Letter, August 3, 1940

BACTERIOLOGY

Bacteria-Killer From Soil Effective in Cattle Disease

PROMISING results in the first trials at treating a real sickness with gramicidin, potent germ-killing chemical from soil bacilli or germs, are reported by Dr. R. B. Little, R. J. Dubos and R. D. Hotchkiss, of the Rockefeller Institute for Medical Research.

The power of this chemical from one kind of a germ to kill other germs that cause deadly diseases caused a sensation in both lay and scientific worlds when Dr. Dubos first announced it.

At that time the chemical's germ-destroying ability had been shown in test-tube experiments and in laboratory mice sick with peritonitis which the scientists had given the animals by injections of pneumonia germs and streptococci.

Trial of the chemical as a remedy in cases of real sickness, instead of experimental ones in the laboratory animals, has now been made. The patients were cows at the Rockefeller Institute's department of animal and plant pathology at Princeton, N. J. They had a chronic form of bovine mastitis caused by germs of the streptococcus family. The germs in this disease generally get into the cow's milk and while they may not cause disease in humans drinking it, they have a deleterious effect on the milk.

Treatment of the cows consisted essentially of injecting a solution of gramicidin into the infected quarter after milking and allowing it to remain until the next milking.

"While the streptococci were not eliminated from all of the infected quarters," the Rockefeller scientists report (*Proceedings, Society for Experimental Biology and Medicine,* July) "they were markedly decreased after each treatment, and the findings thus confirm the results obtained in mice, namely, that gramicidin, when injected directly into an infected focus, exhibits a definite bactericidal effect against streptococci."

The treatment did not produce what might be called a permanent cure in all of the animals treated. This may have been due to the fact that the method of giving the chemical could be bettered. The state of lactation and other factors may have been responsible for the partial failures.

These factors must be considered, the scientists point out, and many more animals must be treated over a longer period of time before the effectiveness of gramicidin in the control of bovine mastitis can be determined.

Science News Letter, August 3, 1940

To avoid disturbing the *water* around fishermen's boats, Missouri Conservation agents will inspect permits "long distance": the fisherman holds his permit aloft and the agent, in a speed boat, inspects it through field glasses.

BOTANY

NATURE RAMBLINGS *by Frank Thone*

Defensio Virgaureae

GOLDENROD, laughing from every fencerow and wasteland, makes the countryside beautiful in late summer. Hayfever sufferers, between sneezes, wipe weeping eyes and curse the supposed cause of their woes.

Thereby they commit a grave injustice, though their conclusion-jumping is perhaps quite natural. They see something conspicuous that comes into flower at just about the time their sufferings begin. Having been taught that pollen is the proximate cause of their misery, they naturally blame the first pollen-producing flower they see.

But it is mechanically almost impossible for goldenrod pollen to get to a hayfeverish nose. It is heavy stuff, and sticky, adapted for insect carriage and not for strewing on the wind. Indeed, it is exceedingly difficult to get it out of the flowers at all, and if it were shaken out it would fall to the ground in anything but the stiffest kind of a summer gale.

The pollen that causes most hayfever while the goldenrod is in bloom comes from ragweeds, which happen to bloom at about the same time. There are two principal ragweed species, the low and the tall, and together they account for more than ninety per cent of all hayfever cases. They escape blame, from all except the well informed, because their flowers are green—and in a world of green plants, green flowers are as good as invisible.

Their pollen fills all the requirements for a first-class hayfever cause. It is produced in terrific abundance, is particularly adapted for wind transportation, and drifts in the lightest breeze. It gets into the densest cities, up to the tops of the highest skyscrapers, even though its nearest patch be miles away.

But the nearest patch needn't be miles away, even in cities. The ragweeds are cockneys among plants, thriving on city dumps, along the waterfront, in railroad yards, under all sorts of slumland conditions. They also grow side by side with goldenrod in the country, elbowing their handsomer cousin for space and sunlight. So they have a chance to assail your nostrils with venomous dust whether you are in a town penthouse or speeding along the highway.

And goldenrod continues to get the blame. There's no justice in this world!

Science News Letter, August 3, 1940

ENTOMOLOGY

Army Ants Use Fan-Shaped Advance Like Nazi Troops

FAN-SHAPED troop movement, characteristic of Nazi invasions, is typical also of the tactics of the army ant.

Many other parallels between the behavior of these marauding insects and human marching men are suggested by observations made at Barro Colorado Island, in the Panama Canal Zone, by Dr. T. C. Schneirla, of New York University.

Completely regimented are these army ants. No individual acts independently. They sweep on in their destructive raids, acting as a mass without thought or individual initiative.

It is the daylight that starts the raid, for the army ant spends the night huddled in a huge bivouac. The direction taken by the main column is determined by available roadways. The ants follow tree roots, fallen trees or vines in much the same way that a human mechanized army must go along highways and over bridges. Scouts in the advance will go beyond the main group but as soon as contact with the mass is lost, they turn about quickly and beat a hasty retreat.

The army ant follows along established lines of communication, which in this case are not telephonic or radio, but chemical. There is an idea for the German technicians to work out! The excited ant who finds prey or booty leaves his own code message of the fact for following detachments to trace. Those who get out of contact with this chemical line of communication would gladly leave for the rear except that traffic in that direction is blocked.

It is the pressure of traffic that governs the advance of army ants, just as it may have held the Nazi blitzkriegers on their relentless forward push. There is nowhere to go but forward. When an army ant hurls himself violently against the enemy or even against another of his own army, he is repelled and either retreats or turns.

This may result in a flanking movement. Another cause for flanking movements is the discovery by one raiding party of rich booty. As soon as booty-laden ants begin to appear along one path, a rush is started in that direction. And, since a thinning of traffic in one territory is always a signal for other ants to move in, the flanking movement is soon under way. This extends the front and initiates a "mopping up" party which kills every foe in the way.

The ants even have their Stukas. Although the particular kind studied by Dr. Schneirla is not accompanied by aircraft, he describes another "swarm raiding" species which has swarms of flies hovering over the forward fringe of the advance, buzzing so loudly that a raid can be located from a distance from their noise. These flies dart down and suddenly attack small moving prey flushed out by the advancing ants.

But the army ants have no Fuehrer. They are a highly organized society of inferior individuals who would function very poorly if alone. "Leadership" is a function of collective behavior, is Dr. Schneirla's conclusion.

Science News Letter, August 3, 1940

Five of the dreaded Japanese *beetles* have been found in Florida.

It takes 90 minutes to make a *mirror* in a new assembly line plant.

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•First Glances at New Books

Additional Reviews On Page 80

GENERAL SCIENCE

EVERYDAY PROBLEMS IN SCIENCE (3d. ed.)—Wilbur L. Beauchamp, John C. Mayfield and Joe Young West—*Scott, Foresman,* 752 p., illus., $1.72. A high school general science text. Interestingly, the frontispiece is a reproduction of newspaper and magazine headlines reporting science advances, an indication that the school today interprets and explains the world today and that the press is giving effective presentation of science.

Science News Letter, August 3, 1940

PHOTOGRAPHY

PORTRAIT PHOTOGRAPHY AS A CAREER—Juan C. Abel—*American Photographic Pub. Co.,* 335 p., illus., $3. A practical book for the professional photographer by an English writer.

Science News Letter, August 3, 1940

JOURNALISM—SOCIOLOGY

BACKGROUNDING THE NEWS, The Newspaper and the Social Sciences—Sidney Kobre—*Twentieth Century Press,* 271 p., $2. This book, of particular interest to the newspaper writer who wants to report news of the social sciences, will also appeal to scientists concerned with the problem of reaching the public with accurate presentations of their research.

Science News Letter, August 3, 1940

METEOROLOGY

CANADIAN POLAR YEAR EXPEDITIONS, 1932-33, Chesterfield Inlet, Meanook and Saskatoon, Vol. II—*Canada, Dept. of Transport, Air Services Branch, Division of Meteorological Services,* 185 p., $5. Consists chiefly of tabulated terrestrial magnetic data, with notes and illustrations on aurorae.

Science News Letter, August 3, 1940

CHEMISTRY—PHYSICS

ELECTROCAPILLARITY, The Chemistry and Physics of Electrodes and Other Charged Surfaces—J. A. V. Butler—*Chemical Pub. Co.,* 208 p., illus., $5. This book "deals with the potential differences at electrified interfaces, the origin and nature of the effects that arise therefrom, and with electrode equilibria and kinetics."

Science News Letter, August 3, 1940

CHEMISTRY

THE SYSTEMATIC IDENTIFICATION OF ORGANIC COMPOUNDS, A Laboratory Manual (2d. ed.)—Ralph L. Shriner and Reynold C. Fuson—*Wiley,* 312 p., $2.75. In this second edition of the work, the authors have been able to incorporate new developments in the identification of these compounds.

Science News Letter, August 3, 1940

PALAEONTOLOGY

FORAMINIFERA, Their Classification and Economic Use (3rd. ed.)—Joseph A. Cushman—*Harvard Univ. Press,* 535 p., illus., $6. Geologists, and especially oil geologists, would be lost without their foraminifera, most useful of all key organisms in determining correlations. The success of this somewhat specialized book, now entering its third edition, is sufficient testimony to the importance of these organisms.

Science News Letter, August 3, 1940

ENGINEERING

SOIL MECHANICS AND FOUNDATIONS—Fred L. Plummer and Stanley M. Dore—*Pitman,* 473 p., illus., $4.50. Though soils are the oldest of construction materials, and are still widely used in earth dams, foundations for various structures, etc., most reference books ignore them. In this work, the authors have clearly described the new methods of approach which have yielded a considerable amount of new knowledge concerning the subject.

Science News Letter, August 3, 1940

ENGINEERING

ELEMENTS OF STRENGTH OF MATERIALS (2d ed.)—S. Timoshenko and Gleason H. MacCullough—*Van Nostrand,* 365 p., illus., $3.25. This second edition of a well-known text used in many American engineering colleges, contains new material, such as an article on welded joints, a chapter on photo-elasticity and a discussion, in an appendix, of moment of inertia.

Science News Letter, August 3, 1940

MEDICINE

ESSENTIALS OF THE DIAGNOSTIC EXAMINATION—John B. Youmans—*Commonwealth Fund,* 417 p., $3.

Science News Letter, August 3, 1940

BIBLIOGRAPHY

QUARTERLY BULLETIN OF CHINESE BIBLIOGRAPHY (English Ed), Vol. I, No. 1, March, 1940—*The National Library of Peiping, Kunming Office, Kunming, Yunnan, China,* quarterly, $2 per year.

Science News Letter, August 3, 1940

HISTORY

WHO WAS WHEN? A Dictionary of Contemporaries—Miriam Allen de Ford—*Wilson,* $4.75. This novel reference book tells when 8,825 of the world's famous folk lived, in the years from 500 B.C. to 1938 A.D. The outstanding feature of the book is its system of charting, whereby contemporaries appear on the same pages, classified according to 11 lines of achievement.

Science News Letter, August 3, 1940

MEDICINE

CARE OF POLIOMYELITIS—Jessie L. Stevenson—*Macmillan,* 230 p., $2.50. A practical and authoritative book for public health and visting nurses on the care of patients with infantile paralysis. The importance of proper care in preventing and lessening crippling and deformity in this disease is such that a book of this kind is extremely valuable for those in any way responsible for such care.

Science News Letter, August 3, 1940

MEDICINE

TRAPPING THE COMMON COLD—George Sanford Foster—*Revell,* 125 p., $1.25. A physician gives, in simple terms for the layman, his views on how to avoid catching cold.

Science News Letter, August 3, 1940

ARCHITECTURE

THE RELIGIOUS ARCHITECTURE OF NEW MEXICO IN THE COLONIAL PERIOD AND SINCE THE AMERICAN OCCUPATION—George Kubler—*The Taylor Museum, Colorado Springs, Colo.,* 232 p., illus., $5. Architecturally analyzed, churches where Indians and colonists worshipped in early New Mexico prove well worth study. Mr. Kubler writes fluently and expertly of the manner in which churches dominated town profiles, theatrical lighting of interiors, factors which produced the block-shaped mass effects of exteriors. Plans and photographs are numerous.

Science News Letter, August 3, 1940

AERONAUTICS

HEROES OF THE AIR (Rev. ed.)—Chelsea Fraser—*Crowell,* 874 p., illus., $2.50.

Science News Letter, August 3, 1940

ECONOMICS

BULLETIN OF THE NATIONAL ASSOCIATION OF WOOL MANUFACTURERS, Vol. LXIX, Activities of the . . . Association . . . , Statistics of the Industry—*National Assn. of Wool Manufacturers,* 600 p., $2.

Science News Letter, August 3, 1940

•First Glances at New Books

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ANATOMY—PHYSIOLOGY

HUMAN BIOLOGY—George Alfred Baitsell—*McGraw-Hill,* 621 p., illus., $3.75. Departing from tradition in writing a college text on biology, Prof. Baitsell presents the subject "from the vantage ground of the most interesting and important organism in the world of life, namely, man." Besides the greater interest students will take in a text written from this angle, Prof. Baitsell believes that students coming to college today are fairly well prepared in general biology and need more advanced material than is available in many of the older college texts if their interest in the subject is to continue.

Science News Letter, August 3, 1940

GEOGRAPHY—PHILOSOPHY

PEAKS AND LAMAS — Marco Pallis — *Knopf,* 428 p., illus., $5. Telling the story of two Tibetan expeditions, the author shifts from the initial goal of physical mountain climbing to explore the "uncharted glaciers and unclimbed ranges" of Hindu and Buddhist tradition. Among the most interesting chapters are those on Tibetan art, and the author's account of his own painting lessons in a monastery.

Science News Letter, August 3, 1940

ARCHAEOLOGY

THE DISCOVERY OF MAN—Stanley Casson—*Harper,* 339 p., illus., $3. A readable history of archaeological and anthropological research, told by one of England's notable archaeologists. It explains why man has been slow to launch into the difficult task of re-discovering his own past.

Science News Letter, August 3, 1940

ARCHAEOLOGY

ARCHAEOLOGICAL STUDIES IN THE LA PLATA DISTRICT, Southwestern Colorado and Northwestern New Mexico—Earl H. Morris—*Carnegie Inst. of Washington,* 298 p., 321 pl., 77 text illus., $5.50, paper; $6.50, cloth. Following a clear summing up of Southwestern archaeology's major problems, Mr. Morris launches into an equally expert report on eight seasons of field work in one region, where a thousand years of habitation ended about 1300 A.D.

Science News Letter, August 3, 1940

ETHNOLOGY

THE SWAZI, An Ethnographic Account of the Natives of the Swaziland Protectorate—Brian Allan Marwick—*Cambridge (Macmillan),* 320 p., $4.25. Knowledge of anthropology is a primary essential in native administration, declares this British government official. Taking his own prescription, he has gone into the field to make the first detailed study of the economic and sociological organization of the Swazi of South Africa, in whose region he served as an administrator for nine years.

Science News Letter, August 3, 1940

ARCHAEOLOGY

EXCAVATIONS AT SAN JOSE, BRITISH HONDURAS — J. Eric Thompson — *Carnegie Inst. of Washington,* 292 p., 33 pl., paper, $3.50; cloth $4. What appears to be a typical small center of Mayan civilization is described through five eras of its career. This "Maya Gopher City," as Dr. Thompson dubs it, imported quantities of pottery from other regions, but why it did so, and what it traded for clay wares, are economic points not yet cleared up.

Science News Letter, August 3, 1940

HISTORY

THE STORY OF THE PACIFIC—Hendrik Willem Van Loon—*Harcourt, Brace,* 387 p., illus., $4. The discovery of the strange, colorful world of Pacific islands and shores, told with a discriminating choice of incidents and in Van Loon's highly readable style.

Science News Letter, August 3, 1940

HISTORY

THE MARCH OF THE BARBARIANS—Harold Lamb—*Doubleday, Doran,* 389 p., $3.75. The story of ruthless hordes of the East that swept over civilizations and imposed dictatorships, long ago. Genghis Khan and his descendants affected the course of history, particularly shaping Russia, the author shows.

Science News Letter, August 3, 1940

HISTORY—GEOGRAPHY

INNER ASIAN FRONTIERS OF CHINA—Owen Lattimore—*American Geographical Society,* 585 p., maps, $4. (American Geographical Society, Research Series, no. 21). With China struggling for survival, the historic background and geographic factors of the interior have important bearing on the Far Eastern situation. This study is comprehensive and enlightening.

Science News Letter, August 3, 1940

CHILD STUDY

STUDIES IN THE DEVELOPMENT OF YOUNG CHILDREN—Nancy Bayley—*Univ. of Calif. Press,* 45 p., 35c.

Science News Letter, August 3, 1940

PSYCHOLOGY

HOW TO OVERCOME STAMMERING — Mabel Farrington Gifford—*Prentice-Hall,* 169 p., $2.25. The author, who was once a stammerer and is now chief of the Bureau for the Correction of Speech Defects and Disorders of California's Department of Education, is convinced that "the essential cause of stammering lies in an emotional maladjustment."

Science News Letter, August 3, 1940

PSYCHOLOGY

THE PERSONALITY STRUCTURE OF STUTTERING—James F. Bender—*Pitman Pub. Co.,* 189 p., $2. This report of a research on college students reveals that stutterers differ from those without speech defect in personality as well as anatomically, physiologically and psychologically. Mental hygiene for the stutterer is recommended.

Science News Letter, August 3, 1940

PSYCHOLOGY

WE CALL IT HUMAN NATURE—Paul Grabbe and Gardner Murphy—*Harper,* 120 p., $2. A beautifully illustrated book presenting the elementary facts of psychology in a way easily understood and appreciated.

Science News Letter, August 3, 1940

ANTHROPOLOGY

ESSAYS IN HISTORICAL ANTHROPOLOGY OF NORTH AMERICA—*Smithsonian Inst.,* 600 p., plates, $2. (Smithsonian Misc. Coll., Vol. 100) Published in honor of Dr. John R. Swanton, in celebration of his fortieth year with the Smithsonian Institution, these essays by his associates deal with broad problems of America's past. A bibliography of Dr. Swanton's publications, and an appreciation of his work by Dr. A. L. Kroeber round out the volume.

Science News Letter, August 3, 1940

HYGIENE

A COLLEGE TEXTBOOK OF HYGIENE (3rd. ed.)—Dean Franklin Smiley and Adrian Gordon Gould—*Macmillan,* 539 p., illus., $2.50. This up-to-date text for college students includes chapters on costs of medical care, patent medicines, public health, and industrial hygiene.

Science News Letter, August 3, 1940

PSYCHOLOGY

BEYOND THE SENSES—Charles Francis Potter—*Doubleday, Doran,* 278 p., $2.50. The author is convinced that telepathy is a scientific fact.

Science News Letter, August 3, 1940